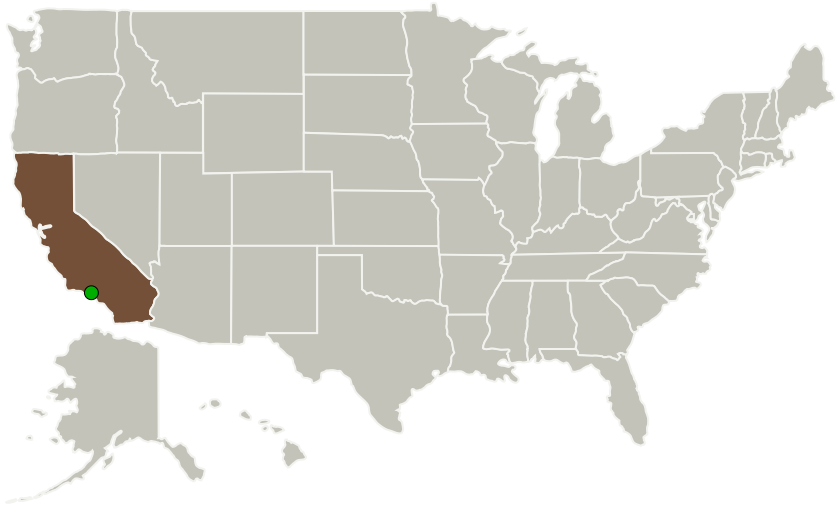
3D Flash LIDAR EDL Resolution Improvement, Phase I

Completed Technology Project (2013 - 2013)

Project Introduction

Advanced Scientific Concepts, Inc. (ASC) is a small business, which has developed a compact, eye-safe 3D Flash LIDARTM Camera (FLC) well suited for real-time spacecraft trajectory, speed, orientation measurements relative to the planet's surfaces and evaluating potential hazards during the critical landing sequence. ASC's Flash LIDAR has been used for autonomous berthing with the International Space Station (ISS) and is currently under development for the OSIRIS-REx asteroid rendezvous mission. Flash LIDAR is also being evaluated by JPL and NASA for Entry Decent and Landing (EDL) for ALHAT and Mars. Through the investigations at JPL and NASA Langley a number of improvements to the technology have been identified as beneficial to landing application. Improved range resolution, spatial resolution, increased sensitivity and greater dynamic range would increase the functionality for successful landing operations. ASC has developed the core technology for Flash LIDAR with its 3D-FPA and is developing higher resolution arrays to address these concerns. ASC currently has on hand high sensitivity 32x32 arrays (shuttle run for the 320x320) that have not been tested with detectors. Initial evaluation suggests that they have increased sensitivity by 50x, spatial resolution by 2.5x, and range resolution by 3x.

Primary U.S. Work Locations and Key Partners



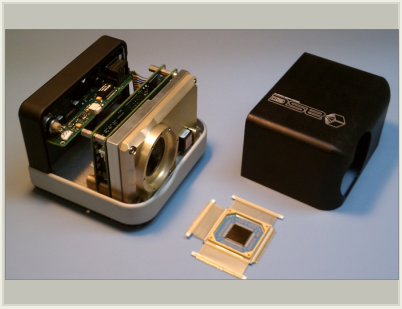


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Advanced Scientific Concepts, Inc.	Lead Organization	Industry	Goleta, California
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations
California

Project Transitions

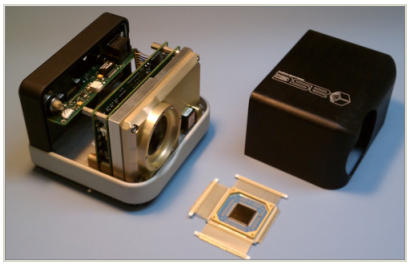
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140460)*

Images



Project Image
3D Flash LIDAR EDL Resolution Improvement
(https://techport.nasa.gov/image/131572)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Scientific Concepts, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Brad Short

Co-Investigator:

Bradley Short

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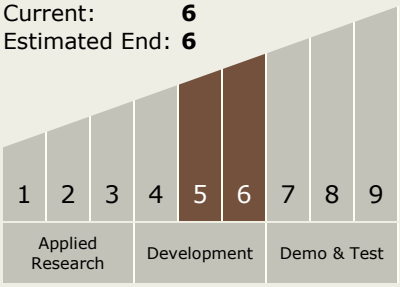
Technology Maturity (TRL)

Start: **5**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
  - TX09.4 Vehicle Systems
    - TX09.4.7 Guidance, Navigation and Control (GN&C) for EDL

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System